

U.S. Application No. 10/010,859 -- 10

In the Drawings:

Please amend Figures 1 and 3 in accordance with replacement sheets 1/21 and 2/21 of the drawings attached hereto.

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REMARKS

Claims 1 - 18 remain in the application. Claims 1 - 2, 4 - 5, 7 - 8, 12 - 13, and 15 - 18 have been amended. Reconsideration of this application in view of the amendments noted is respectfully requested.

In the Office Action, the drawings were objected to as failing to comply with 37 C.F.R. 1.84(p)(5) because they did not include reference characters 24 and 38 mentioned in the description. Replacement sheets for sheets 1/21 and 2/21 of the drawings are included herewith. Reference character 24 has been added to Fig. 1 and reference character 38 has been added to Fig. 3.

The drawings were also objected to because they included reference characters 23, S138, S168, S194, and S214 that were not mentioned in the description. With respect to reference character 23, applicant disagrees that this reference character is not mentioned in the specification. Reference character 23 refers to the automatic execution control unit and is found on page 8, lines 5 and 9 of the specification.

With respect to reference character S138, "step 138" has been added to the specification in the paragraph beginning on page 15, line 14. With respect to reference character S168, "step 168" has been added to the specification in the paragraph beginning on page 17, line 29. With respect to reference character S194, "step 194" has been added to the specification in the paragraph beginning on page 20, line 5. With respect to reference character S214, "step 214" has been added to the specification in the paragraph beginning on page 23, line 12.

Applicant submits that the drawings now comply with 37 C.F.R. 1.84(p)(5).

Claims 1, 4, 6, 8, 9, and 11 were rejected under 35 U.S.C. 102(e) as being anticipated by Underwood et al. (U.S. Patent No. 6,109,722, hereinafter "Underwood"). Applicant respectfully traverses this rejection.

With respect to claim 1, applicant has amended claim 1 such that "plural parallel bars" now read --plural bars--. Further, applicant has added the limitation that the plural bars include "at least two bars with different inclination relative to each other."

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Underwood does not disclose recording plural bars on a recording medium with a second recording head of plural recording heads, the plural bars overlapping plural reference parallel bars to form a recording position adjusting pattern and including at least two bars with different inclination relative to each other, as claim 1 requires. In Underwood, the sequence of extended-area "first alignment elements" have the same inclination relative to each other and the overlaying sequence of extended-area "second alignment elements" also have the same inclination relative to each other. There are no plural bars overlapping plural reference parallel bars, the plural bars including at least two bars with different inclination in Underwood. Therefore, Underwood does not anticipate claim 1 of the present application.

Further, none of the other cited references teach or suggest plural bars overlapping plural reference parallel bars and including at least two bars with different inclination. Otsuki merely discloses that the inclination of test pattern bars may be different on a forward pass in the main scanning direction than on the backward pass. However, all the bars printed on the forward pass have the same inclination, and all the bars printed on the backward pass have the same inclination. In Otsuki, the closest equivalent to the plural bars are the bars printed during the backward pass ("printed during reverse pass" in Figure 8 of Otsuki), and all of the bars printed during the backward pass have the same inclination. Hence, in Otsuki, it can be said that the reference bars have a different inclination from the plural bars, but the plural bars do not have different inclinations relative to each other. Therefore, in Otsuki, all the bars printed on the backward pass have the same relative difference in inclination from all of the bars printed on the forward pass (see Figures 6 - 8 of Otsuki). Hence, Otsuki does not teach or suggest recording plural bars overlapping plural reference bars and having at least two bars with different inclination with respect to each other, as required by claim 1. For these reasons, claim 1 is allowable over the cited references.

With respect to claims 4 and 6, these claims depend directly from claim 1. As stated above, claim 1 is allowable. Therefore, claims 4 and 6, depending from claim 1, are themselves allowable.

With respect to claim 8, similar to claim 1, claim 8 has been amended to add the limitation that "the plural bars include at least two bars with different inclination relative to each other and each of the two bars is recorded between adjacent bars of the reference parallel bars." Also, claim 8 has been amended such that "plural parallel bars" now reads --plural bars--. Applicant incorporates by reference the arguments made with respect to claim 1 above. As stated above, Underwood does not disclose plural bars including at least two bars with different inclination relative to each other and each of the two bars being recorded between adjacent bars of reference parallel bars. Further, none of the other cited references teach or suggest these features. Therefore, Underwood does not anticipate claim 8, and claim 8 is allowable over the cited references.

With respect to claims 9 and 11, these claims depend directly from claim 8. As stated above, claim 8 is allowable. Therefore, claims 9 and 11, depending from claim 8, are themselves allowable.

For all of the reasons stated above, claims 1, 4, 6, 8, 9, and 11 are not anticipated by Underwood and are allowable over the cited references. Therefore, applicant respectfully requests that the Section 102(e) rejection of claims 1, 4, 6, 8, 9, and 11 over Underwood be withdrawn.

Claims 12, 13, and 15 - 18 were rejected under 35 U.S.C. 103(a) as being unpatentable over Underwood in view of Otsuki (U.S. Patent No. 6,554,387). Applicant respectfully traverses this rejection.

With respect to claim 12, similar to claim 1, claim 12 has been amended to include the limitation that "the plural bars include at least two bars with different inclination relative to each other and each of the two bars is recorded between adjacent bars of the reference parallel bars." Also, claim 12 has been amended such that "plural parallel bars" now reads --plural bars--. Applicant incorporates by reference the arguments made with respect to claim 1 above. Underwood and Otsuki neither alone nor in combination teach or suggest the limitations of claim 12. Otsuki merely discloses that the inclination of the test pattern bars may be different on the forward pass in the main scanning direction than on the

backward pass. However, all the bars printed on the forward pass have the same inclination, and all the bars printed on the backward pass have the same inclination. Therefore, in Otsuki, all the bars printed on the backward pass have the same relative difference in inclination from all of the bars printed on the forward pass (see Figures 6 - 8 of Otsuki). Hence, Otsuki does not teach or suggest recording plural bars including at least two bars with different inclination with respect to each other and each of the two bars being recorded between adjacent bars of the reference parallel bars as required by claim 12. Therefore, claim 12 is patentable over Underwood and Otsuki.

With respect to claim 13, similar to claims 1 and 12, claim 13 has been amended to include the limitation that "the plural bars include at least two bars with different inclination relative to each other and each of the two bars is recorded between adjacent bars of the reference parallel bars." Also, claim 13 has been amended such that "plural parallel bars" now reads --plural bars--. Applicant incorporates by reference the arguments made with respect to claims 1 and 12 above. For the same reasons as recited above with respect to claims 1 and 12, Underwood and Otsuki neither alone nor in combination teach or suggest the limitations of claim 13. Therefore, claim 13 is patentable over Underwood and Otsuki.

With respect to claim 15, similar to claims 1, 12, and 13, claim 15 has been amended to include the limitation that "the plural bars include at least two bars with different inclination relative to each other and each of the two bars is recorded between adjacent bars of the reference parallel bars." Also, claim 15 has been amended such that "plural parallel bars" now reads --plural bars--. Applicant incorporates by reference the arguments made with respect to claims 1, 12, and 13 above. For the same reasons as recited above with respect to claims 1, 12, and 13, Underwood and Otsuki neither alone nor in combination teach or suggest the limitations of claim 15. Therefore, claim 15 is patentable over Underwood and Otsuki.

With respect to claim 16, "plural parallel bars" has been amended to read --plural bars-- to be consistent with base claim 15. Claim 16 depends directly from claim 15. As

stated above, claim 15 is allowable over Underwood and Otsuki. Therefore, claim 16, depending directly from claim 15, is also allowable over Underwood and Otsuki.

With respect to claim 17, similar to claims 1, 12, 13, and 15, claim 17 has been amended to include the limitation that "the plural bars include at least two bars with different inclination relative to each other and each of the two bars is recorded between adjacent bars of the reference parallel bars." Also, claim 17 has been amended such that "plural parallel bars" now reads --plural bars--. Applicant incorporates by reference the arguments made with respect to claims 1, 12, 13, and 15 above. For the same reasons as recited above with respect to claims 1, 12, 13, and 15, Underwood and Otsuki neither alone nor in combination teach or suggest the limitations of claim 17. Therefore, claim 17 is patentable over Underwood and Otsuki.

With respect to claim 18, as a formality, the word "further" has been added in front of "comprising." Claim 18 depends directly from claim 15. As stated above, claim 15 is allowable over Underwood and Otsuki. Therefore, claim 18, depending directly from claim 15, is also allowable over Underwood and Otsuki.

For all the reasons stated above, claims 12, 13, and 15 - 18 are patentable over Underwood and Otsuki. Therefore, applicant respectfully requests that the Section 103(a) rejection of claims 12, 13, and 15 - 18 over Underwood in view of Otsuki be withdrawn.

Claims 2, 3, 5, and 7 were rejected under 35 U.S.C. 103(a) as being unpatentable over Underwood as applied to claims 1 and 4 above, and further in view of Otsuki. Applicant respectfully traverses this rejection.

With respect to claim 2, as a formality, the word "further" has been added in front of "comprising." Applicant incorporates by reference the arguments made above with respect to claim 1. Otsuki does not teach or suggest adjusting an inclination of the reference parallel bars which is due to the inclination of the reference recording head, as required by claim 2. Otsuki discloses that in the case that the inclination of the test bars are different in the forward pass direction from that of the backward pass, the misalignment of recording positions is corrected by regulating the ejection timing of ink droplets (see Otsuki, column 8,

lines 26 – 57, especially lines 54 – 57). Hence, Otsuki teaches adjustment of the ejection timing to compensate for misalignment between forward and backward passes, not adjustment of the inclination of the recording head. In other words, Otsuki does not teach adjusting the tilt of the recording heads. Further, the difference in inclination in Otsuki is a result of the misalignment of the nozzle array and not done purposely (i.e., adjusted) to create a test pattern. Moreover, Otsuki does not alter the inclination of the recording head but merely adjusts the ejection timing of the nozzles to compensate for the misalignment. Therefore, claim 2 is patentable over Underwood and Otsuki.

With respect to claim 3, applicant incorporates by reference the arguments made above with respect to claim 1. Otsuki does not teach or suggest plural parallel bars having different inclinations respectively. Otsuki merely discloses that the test bars printed during the forward pass may have a different inclination than the test bars printed during the backward pass. In Otsuki, the closest equivalent to the plural bars are the bars printed during the backward pass (“printed during reverse pass” in Figure 8 of Otsuki), and all of the bars printed during the backward pass have the same inclination. Hence, in Otsuki, it can be said that the reference bars have a different inclination from the plural bars, but the plural bars do not have different inclinations relative to each other as required by claim 3. Therefore, claim 3 is patentable over Underwood and Otsuki.

With respect to claim 5, claim 5 has been amended to read that “the plural bars of the second set of plural pattern blocks have different inclinations between each block.” This is to clarify that claim 5 corresponds to FIG. 12, wherein the plural reference bars comprise a first set of plural reference pattern blocks and the plural bars comprise a second set of plural pattern blocks, and the plural bars of the second set of plural pattern blocks have different inclinations between each block. Further, applicant incorporates by reference the arguments made with respect to claims 1 and 4 above. Otsuki does not teach or suggest that the plural bars of the second set of plural pattern blocks have different inclinations between each block. Otsuki merely discloses that the test bars printed during the forward pass may have a different inclination than the test bars printed during the backward

pass. In Otsuki, the closest equivalent to the plural bars are the bars printed during the backward pass ("printed during reverse pass" in Figure 8 of Otsuki), and all of the bars printed during the backward pass have the same inclination. Hence, in Otsuki, it can be said that the reference bars have a different inclination from the plural bars, but blocks of the plural bars do not have different inclinations relative to each other as required by claim 5. Therefore, claim 5 is patentable over Underwood and Otsuki.

With respect to claim 7, as a formality, the word "further" has been added in front of "comprising." Applicant incorporates by reference the arguments made above with respect to claim 1. Otsuki does not teach or suggest adjusting an inclination of the reference parallel bars which is due to the inclination of the reference recording head, as required by claim 7. Otsuki discloses that in the case that the inclination of the test bars are different in the forward pass direction from that of the backward pass, the misalignment of recording positions is corrected by regulating the ejection timing of ink droplets (see Otsuki, column 8, lines 26 - 57, especially lines 54 - 57). Hence, Otsuki teaches adjustment of the ejection timing to compensate for misalignment between forward and backward passes, not adjustment of the inclination of the recording head. In other words, Otsuki does not teach adjusting the tilt of the recording heads. Further, Otsuki has no teaching or suggestion to adjust the inclination of reference parallel bars. Moreover, the difference in inclination in Otsuki is a result of the misalignment of the nozzle array and not done purposely (i.e., adjusted) to create a test pattern. Therefore, claim 7 is patentable over Underwood and Otsuki.

For all the reasons stated above, claims 2, 3, 5, and 7 are patentable over Underwood and Otsuki. Therefore, applicant respectfully requests that the Section 103(a) rejection of claims 2, 3, 5, and 7 over Underwood as applied to claims 1 and 4 in further view of Otsuki be withdrawn.

Claim 10 was rejected under 35 U.S.C. 103(a) as being unpatentable over Underwood as applied to claim 8 above, and further in view of Takahashi et al. (U.S. Patent No. 6,532,026, hereinafter "Takahashi"). Applicant respectfully traverses this rejection.

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Applicant incorporates by reference the arguments made with respect to claim 8 above. Takahashi does not teach or suggest an optical detection unit that detects a recording position adjusting pattern on a downstream side of a recording direction in a direction that intersects with a scanning direction of the plural recording heads as required by claim 8. Takahashi discloses an optical sensor that is mounted on a carriage and is moved to the respective position corresponding to the respective patch for measurement of a reflected optical density (column 11, line 63 – column 12, line 2). Takahashi also discloses that the position at which the reflective optical sensor is attached to the carriage is set at the position where the ejection opening section of the print head does not pass in order to prevent splashed droplets of ink or the like from depositing during printing scanning (column 17, lines 16 – 20). The optical sensor of Takahashi, however, cannot be on a downstream side of a recording direction that intersects with a scanning direction of the plural recording heads because Takahashi specifically states that the optical sensor is attached to the carriage at a position where the ejection opening section of the print head does not pass.

Moreover, the limitations of base claim 8 are not taught or suggested by Underwood or Takahashi, namely that the plural bars include at least two bars with different inclination relative to each other and each of the two bars is recorded between adjacent bars of the reference parallel bars. Hence, claim 8 is allowable over Underwood and Takahashi. Claim 10, depending directly from claim 8, is therefore also allowable as depending from an allowable base claim.

For these reasons, claim 10 is patentable over Underwood and Takahashi. Therefore, applicant respectfully requests that the Section 103(a) rejection of claim 10 over Underwood as applied to claim 8 in further view of Takahashi be withdrawn.

Claim 14 was rejected under 35 U.S.C. 103(a) as being unpatentable over Underwood and Otsuki as applied to claim 13 above, and further in view of Takahashi. Applicant respectfully traverses this rejection.

Applicant incorporates by reference the arguments made with respect to claim 13 above. Underwood, Otsuki, and Takahashi neither alone nor in combination teach or

suggest the limitations of base claim 13, namely that the plural bars include at least two bars with different inclination relative to each other and each of the two bars is recorded between adjacent bars of the reference parallel bars. Hence, claim 13 is allowable over Underwood, Otsuki, and Takahashi. Claim 14, depending directly from claim 13, is therefore also allowable as depending from an allowable base claim.

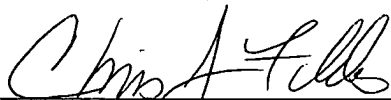
For these reasons, claim 14 is patentable over Underwood, Otsuki, and Takahashi. Therefore, applicant respectfully requests that the Section 103(a) rejection of claim 14 over Underwood and Otsuki as applied to claim 13 in further view of Takahashi be withdrawn.

This amendment and request for reconsideration is believed to be fully responsive to the rejections and comments of the examiner and to place this application in condition for allowance. Favorable action is requested.

Respectfully submitted,

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